REMARKS

The present office action draws into question whether the new reference Tuman et al., US-2001-0016245 alone or with other references fairly makes the present invention obvious, paragraphs 10, 11, 15 and 16.

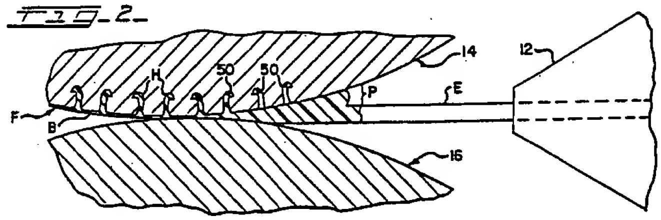
A second issue is whether the previously cited reference Kennedy et al., 5,260,015, though not specifically mentioning it, effectively teaches making fastener products with elastically stretchable sheet material, and whether any proper combination of its fair teaching with other references makes the present invention obvious. The Kennedy et al. issue is raised respecting Tuman et al., paragraph 10 and 11, Murasaki, paragraph 12 and 13, the claims of Application No. 10/271,494, paragraph 15, and the claims of Application No. 10/803,682, paragraph 16.

A further issue is whether the teachings of Murasaki et al. have been fairly understood by the Examiner, see paragraphs 12 and 13, and whether modifying Murasaki et al. to arrive at the present invention would have been an obvious thing to do.

After discussing the present invention, we will address the Tuman et al. and the Kennedy et al. references in general, and then address the specific rejections.

Independent method claim 84 has been amended to clarify the nature of the aspect of the invention recited in that claim. In its broadest aspect, the claimed invention concerns molding separated groups of loop-engageable fastener hooks of resin in cavities of a molding roll while laminating the resin base layer portions of the separated groups of hooks to an elastically stretchable sheet material, this material extending substantially free of resin between the groups of hooks. By stripping the product from the mold roll, a stretchable fastener hook product is produced. This is a novel adaptation of the <u>Fischer fixed-cavity hook-molding</u> technique and the Kennedy <u>*in situ*</u> lamination technique, with very important changes. Fischer 4,872,243 is incorporated by reference on page 14, line 12 of the present application; Kennedy et al. 5,260,015 is referred to at page 20, line 8.

By the Fischer technique, fixed cavity molds form end portions of the hooks that extend back toward the respective base layer B of the hooks. An early version of a product molded with the Fischer technique is shown in Fig. 2 of Fischer '243, as follows:



A product producible by method claim 84 of the present invention, is given in Fig. 1B of the application as follows:

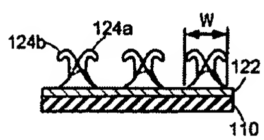


FIG. 1B

As is known, hooks made by the Fischer fixed mold technique are capable of highly effective releasable fastening action with loops of fastener materials. The technique has been in commercial use for several years, and has been demonstrated to produce very reliable loop-engageable fastener hooks.

Other proposals for applying fastener formations to substrates have had disadvantages, such as in producing less secure fastening or requiring additional manufacturing steps.

The cited Tuman et al. '245 reference is an example of this. It involves molding separated groups of stems ("rod-like projections") in patches or stripes on a web which may be stretchy. Rod-form stems molded in straight mold holes can release relatively easily from the mold holes with little tension on the overall sheet during stripping. Tuman et al., in one case, suggests molding the stems in tilted orientations (see '245, pars. 29 and 30). For general use this

would present serious risk of inadequate loop engagement due to slight bending and slippage of the stems from the loops. Apparently recognizing this deficiency, Tuman et al. proposes, following molding of groups of rod-like stems, performing a secondary operation to form hook formations on the ends of the stems, see '245, para. 28. The "post-molding" operation would flatten free ends of the molded stems to form mushroom heads, or bend them appropriately. To do this requires additional handling of the product, can increase cost, can create excessively aggressive hooks and fails to provide the design flexibility provided by the Fischer technique.

In general, therefore, the Tuman et al. '245 proposal has left much to be desired.

An important difference in the claimed invention over Tuman et al, is evident in the portions of Applicants' hooks that are molded to extend back toward the base layer portions of the hooks. This is clearly recited in amended claim 84. Molding such end portions is recognized to impose a demanding requirement that is not in common with Tuman et al. Specifically, elevated mold-stripping tension must be applied, in comparison to the methods shown in Tuman et al., to progressively strip Applicants' reversely shaped hook ends from their molds. The elevated tension is needed to cause each of the molded end portions to elastically distort so it can be pulled from its mold cavity through the stem portion of the cavity. For an overall final product with given characteristics, if the tension required for pulling the hooks from the mold cavities were more than that which could be applied without harming the product, the product could clearly not be produced in commercial practice.

Given this greater tension requirement for stripping such molded fastener elements, it is apparent that what may work for the Tuman et al. plain stems could not be said to be obviously workable for the present invention as recited in claim 84.

The tension requirement is further accentuated when the hook end portions are oriented in opposite directions, see new claim 104, especially when so oriented in the longitudinal direction, claim 105, because extreme crook-bending is required during pull of such hooks from their mold cavities.

Now addressing the Kennedy et al. reference that teaches *in situ* lamination:

In the original Fischer process, to enable the resin product to be stripped from the mold roll after cooling, tensile strength for pulling the hooks from their mold cavities was provided by the thickness of the widthwise- and lengthwise-continuous resin base layer B from which the hooks extend. In Fischer, this continuous resin layer is formed on the outer surface of the cooled mold roll while the hooks themselves are molded within fixed mold cavities within the mold roll.

Kennedy et al., U.S. 5,260,015, while introducing a pre-formed sheet material, also, like Fischer, produced a widthwise-and lengthwise-continuous resin base layer 20. In this case, the resin base layer was laminated face-to-face *in situ* to the preformed sheet material being introduced. Thus the continuous resin base layer of Kennedy served as a complete backing to the introduced sheet material Tensile strength of the overall laminate was significantly dependent on the widthwise- and lengthwise-continuous resin base layer 20; the continuous resin layer served to bear and distribute much of the tension applied to pull the hooks from their mold cavities.

Nothing in Kennedy et al. taught that a mere sheet material that in places lacks substantial resin backing, would acceptably withstand and transmit such forces in a way that would not result in tearing or delamination.

Further, there is a persuasive reason why the fair teaching of Kennedy et al. should be construed not to include use of material that is elastically stretchable: there is no mention whatsoever in Kennedy et al. of the possibility of employing an elastically stretchable sheet material. All supporting examples of loop material given in Kennedy et al. are known not to be elastically stretchable sheet material. Their construction is as follows:

> Examples V and VI: Velcro USA Loop 3200, a tricot knitted fabric incorporating a fluid-applied, non-elastic acrylic binder substance in the ground structure of the knitted fabric that anchors the hook-engageable loops to the ground structure and renders the overall fabric essentially not elastically stretchable in the plane of the fabric.
>
> Example VII: Velcro USA Loop 3610, a warp knitted fabric incorporating a similar acrylic binder that serves the same function as in Loop 3200.
>
> Example VIII: Velcro USA Loop 3003, a circular knitted fabric incorporating a similar acrylic binder that serves the same function as in Loop 3200.
>
> Therefore:

a) there is no fair teaching in Kennedy et al. that a product could be formed in which the resin base layer 20 could be discontinuous, and the product still be successfully stripped from the fixed mold cavities;

b) there is no fair teaching in Kennedy et al. to employ an elastically stretchable sheet material for *in situ* lamination with hooks being formed; and furthermore

c) even were an elastically stretchable sheet material to be used in Kennedy et al., because of the presence of the widthwise-and lengthwise-continuous resin backing layer 20 in the laminate of Kennedy et al., there would be no teaching in Kennedy et al. of forming an elastically stretchable molded hook product, or the process for doing so.

The wish to have spaced regions of fasteners carried on stretchy materials, so that the overall product is elastically stretchy, is an old wish. Nevertheless, there is no suggestion in either Tuman et al. or Kennedy et al. that desired elastically stretchy materials could be laminated *in situ* with spaced apart regions of the reliable Fischer-type hooks molded by the desirable but demanding fixed mold technique, with hook ends directed back toward the resin base layer portions for loop engagement and retention. At the time of this invention, two relationships seemed incompatible: the Fischer process (molded hooks formed in fixed mold cavities, with hook ends directed back toward the base layer), requires an important degree of tension on the product sufficient to distort and pull the hook ends from their fixed mold cavities; on the other hand, elastically stretchy substrates are expected to elastically yield rather than transmit full tension. Indeed, stretchy materials are often used to relieve tension.

The realization that these relationships are compatible in the claimed context supports the patentability of claim 84.

Turning now to the office action, in respect of patentability of the claims prior to the current amendment:

> 10. Claims 84, 85, 88, 89, 93-95, 97-103 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tuman et al. (US Pub. No. 2001/0016245) optionally in view of Kennedy et al. (US Patent No. 5,260,015).

For reasons referred to above, the Tuman et al. reference does not anticipate now-amended independent claim 84 under 102(e). Tuman et al. lacks the suggestion of molding "free end portions directed generally back toward their respective base layer portions".

We submit, neither does Tuman et al. render claim 84 obvious. In regard to a molding step, Tuman et al. merely teaches molding plain, rod-like stems. As discussed in Melbye et al. (US Patent No. 5,077,870; relied on in Tuman et al. at [0003]), use of tapered circular cavities even further facilitates stripping of plain stems from the mold (Melbye et al., col. 3, lines 32-39).

In respect of achieving loop-engageable heads, as we have mentioned, Tuman et al. always requires a secondary operation. Specifically, Tuman et al. teaches forming "stems [that] are protrusions extending from the web" ([0020]) <u>and then</u> forming 'hooks' "by capping the stems to form mushroom heads" or "by bending them", contacting with a "heated surface to alter the shapes of the stems" ([0028]).

As explained above, stripping from a mold roll the loop-engageable hook elements, having the featured molded free end portions directed back toward their base portions, requires that the resulting product be tensioned significantly to force the hooks to bend, deflect, and be pulled from their mold cavities. This is an inherently different, and more demanding process from that of Tuman et al., who was teaching demolding plain stems. The suggestion that a Tuman et al. plain stem process could tolerate the added sheet material being stretchy provides no basis for assuming the same where much elevated tension is required.

Thus, Tuman et al. neither discloses nor fairly suggests the method of claim 84, use of a mold roll having fixed mold cavities shaped to form the hook elements with molded free end portions that are directed generally back toward their respective base layer portions, and pulling such hook forms from their molds with an elastically stretchy product.

Kennedy et al. does not overcome the lack of teaching of Tuman et al., or vice versa, because (1) on this subject, these two references are basically incompatible, and (2) even if the teachings of these two references could be properly combined, a fundamental requirement of the present claims would still be missing.

(1) Tuman et al., to form headed hooks, first molds plain stems (inherently easy to release from a mold) and follows with a heading operation. With plain stems, one may not anticipate a

problem with use of an elastically stretchy or elastomer-containing material as the carrier for stems being stripped from their holes. However, to modify Tuman et al. to mold fastener elements having Kennedy et al.'s much-more-difficult-to-release, molded hook portions with ends directed back toward their base layer portions would throw away Tuman et al.'s main teaching of straight-stem formation, and would introduce a mold-release concern carefully avoided by Tuman et al. Therefore, these two references are submitted to be incompatible on the point for which their teachings are sought to be combined, and there has not been shown to be any motivation sufficient to overcome such incompatibility.

(2) Furthermore, any theoretical combination of their disclosures would still fail to teach the present invention. Note that the Kennedy et al. disclosure is of a widthwise-and lengthwise-continuous base layer 20 of plastic resin *in situ* laminated to the sheet material; it is this continuous multilayer laminate that is available to apply the required mold-release tension to pull the directed hook ends from their molds. There is no teaching in either Tuman et al. or Kennedy et al., that a sheet material with exposed (un-backed) portions of elastically stretchable material can successfully apply the tension needed to remove from their mold cavities the molded hooks having end portions directed back toward their base portions without delamination, tearing, or over-stretching.

In summary, we submit, these references are incompatible on the critical point; they teach away from each other; and there is absence of full teaching in each of them and in any fair combination of their instruction; hence, it is submitted, the proposed combination of Tuman et al. and Kennedy et al. fails as a proper ground for rejection of amended claim 84.

The result of amended claim 84 is the production of hook materials that are at once elastically stretchy and have superior loop-engaging performance. Claims 85, 88, 89, 93-95 and 97-105 are dependent on claim 84 and allowable over these references for the same as well as for other reasons.

What has been said of claim 84 is the more true with respect to claims 104 and 105, requiring molded, free end hook portions oriented in opposite directions, especially (claim 105) when oriented in the longitudinal direction.

Applicants respectfully submit that, for the reasons discussed above, Tuman et al. does not anticipate the invention of the claims and that neither Tuman et al. alone, nor in any proper combination with Kennedy et al., would have made the invention obvious to one of ordinary skill.

> 11. Claims 87-90, 96, 97, 100, and 101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuman et al. optionally in view of Kennedy et al. as applied to 84 above and further in view of Weirich (WO 97/25893), Varona (WO 99/22619 or US Patent No. 6,197,404) and/or Shepard '452 (WO 99/11452).

Applicants respectfully submit that these claims are allowable as depending from an allowable claim, 84.

The Examiner explained, on page 16, that Weirich et al., Varona, and Shepard et al. "were cited to show that it is known in the art to form loop materials that are elastic." We have shown that Kennedy et al. do not teach that an elastic sheet material could or should be used to pull the molded hooks from their fixed molds. Even if, contrary to teaching, they were used in Kennedy, they would become entirely backed by a widthwise-and lengthwise-continuous resin base layer 20, resulting in a non-elastic product. Neither Kennedy et al. nor any of the three added references alone or in any permissible combination make up for the deficiency in the teaching of Tuman et al. Claims 87-90, 96, 97, 100 and 101 are thus submitted to be patentable over the cited combination of references.

> 12. Claims 84, 85, 87-90, 93-97, and 99-103 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murasaki (U.S. Patent no. 5,643,651) in view of Kennedy et al. (U.S. Patent No. 5,260,015), and further in view of Weirich (WO 97/25893), Varona (WO 99/22619 or US Patent No. 6,197,404) and/or Shepard '452 (WO 99/11452).

Applicants submit that this rejection of claim 84 is inappropriate, and request that it be withdrawn.

Careful examination of the Murasaki et al. U.S. 5,643,651 reference shows that its purpose has nothing to do with making an elastically stretchable hook product nor one which includes loops. The aims of Murasaki et al. concern making a conformable overall hook sheet that has significant tear resistance, see col. 1, line 13. The aims are to provide a "sheet which is divided into a desired number of [molded hook] sections via part of a hard-to-tear sheet-like

connector", col. 1, line 40-42, or a substrate sheet in which the molded sections have a "degree of toughness", col. 1, line 47, 48, while connecting areas between the molded sections of hooks "also have a predetermined degree of toughness", col. 1, line 49.

Murasaki et al. propose to achieve these purposes by passing molten resin "through a coarse sheet-like connector having spaces [open pores] enough for the resin to pass...[so that] the connector is embedded in the substrate", col. 1, lines 53-58, emphasis added. Murasaki et al. emphasize the need for "open spaces over its entire area through which molten resin is to be passed during the molding of the substrate sheet", col. 2, line 13-14, and again "The sheet-like connector to be used in this invention must have over its entire area adequate open space through which molten resin can easily be passed", col. 2, line 19-21, emphasis added, and see Murasaki et al., claim 1, lines 34, 35.

As shown in Fig. 1, the embedding method of Murasaki et al. is to introduce molten plastic resin against the outside of a perforate connector sheet so that the resin must pass through the sheet to reach and fill the hook mold cavities residing on the inside of the sheet. As a result, the connector sheet inherently becomes "embedded" in the plastic (see col. 1, line 58 and col. 6, line 35). This, according to Murasaki et al., produces a reinforced, tough product.

For good reasons, this rejection of paragraph 12 should be withdrawn.

First, the present office action is incorrect in saying, at the last line of page 8, that the action of Murasaki et al. is "to laminate a surface of the [pre-formed sheet] material to the [resin] bases" [emphasis added]. Instead, to the contrary, the Murasaki et al. sheet material is fully embedded. In Murasaki et al. there is no lamination of "a surface of the sheet material to surfaces of the resin base layer portions opposite the hook side of the product" as required by amended claim 84. Such a distinction is not trivial, and there is no readily ascertainable motivation for one of ordinary skill in the art sufficient to undertake the extensive modification of Murasaki's molding method that would be required to form such a laminated structure. And were someone to have considered such extensive modifications, it would have been in the face both of Murasaki's stated objectives and the understanding, discussed above, of the significant stripping forces required to de-mold these fastener elements, forces clearly more readily borne by a tough, structure having embedded reinforcement than by a surface-laminated structure as recited in claim 84.

Second, there is no showing that any of the sheet materials suggested in the secondary references have the open spaces taught as necessary for the Murasaki et al. process to permit molten resin flow through the thickness of the sheet material to the mold cavities, which is essential to the Murasaki et al. technique.

Third, substitution of loop material or stretchy loop material as the Examiner now suggests would not achieve the Murasaki et al. purpose. Murasaki et al. were looking to produce a tough, flexible product. The fact that a loop material was used in a different reference, Kennedy et al., for producing a different product (a two-sided hook and loop product) would not be expected to meet Murasaki's need for an open fabric that is tough and suitable to pass molten resin and be embedded as a reinforcement, to produce a tough, flexible product.

We submit that the Examiner has fallen into use of impermissible hindsight to reconstruct the teaching of the primary Murasaki et al. reference. This is further evidenced in the stated reasons for rejecting various dependent claims. For example, the Examiner says on page 9 of the office action with respect to claim 98, that "Kennedy discloses providing the resin region on only one surface of the web only to a degree to firmly hold the resin region to the web and does not encase or impregnate the web to destroy the aesthetic characteristics...[of the] backing material" and goes on to say that "It would have been obvious to one of ordinary skill in the art at the time of the invention to form the web as shown in Murasaki with bands of resin regions where the resin is applied to only one surface of the web in order to not fully encase or impregnate the web and to not destroy the aesthetic characteristics of the web..."

The "motivation" that the Examiner here proposes is contradictory to the Murasaki et al. goal of making a tough product and to their method of making the tough product. Aesthetic concerns or the making of loop-backed product, or a product with only a surface bond, were quite obviously foreign to Murasaki et al.'s embedding aim. The Examiner's proposed reconstruction would in all likelihood result in a less tough product than Murasaki's idea of embedding a reinforcing sheet fully in the plastic, and would not even be workable without an extensive reconfiguration of the process taught by Murasaki.

The Examiner's proposal would thus require changing the machine and method of Murasaki et al. to an entirely different principle from that taught. Such reconstruction of the

primary reference, we suggest, is based on impermissible hindsight and would result in a product and method inconsistent with what Murasaki et al. had in mind.

The unrelated references, merely showing the availability of elastically stretchable loop materials, do not address the issues noted above that work against any suggested motivation for using such materials in the fully embedding process of Murasaki et al. or in the *in situ* lamination process of Kennedy et al. None of Weirich, Verona and Shepard provide any teaching that would have led one of ordinary skill to foresee how to address such issues to arrive at the method of the present claims.

For these reasons, the proper conclusion, Applicants submit, is that the method of amended claim 84 and dependent claims are unobvious over Murasaki et al. despite Kennedy et al., Weirich et al., Varona, and Shepard et al.

Provisional Rejection for Double Patenting Paragraphs 15 and 16

Applicants hereby offer to submit terminal disclaimers with respect to any patents issued, based on the disclosure of U.S. Application No. 10/271,494 or 10/803,682 that contain relevant claims.

Information Disclosure Statement

The foreign references cited in the Information Disclosure Statement filed August 20, 2001 are submitted herewith. Applicants acknowledge that U.S. Patent No. 5,231,738 submitted on the Information Disclosure Statement filed November 10, 2004 was already cited in the Information Disclosure Statement filed August 20, 2001.

Specification

Applicants amend the specification to correct grammatical and other minor errors including the informality objected to by the Examiner.

Enclosed is a $1,020.00 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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